

ACCESSION NUMBER: 2007(18):9829 COMPENDEX
TITLE: Investigation of the effects of the local environment on the surface-enhanced Raman spectra of striped gold/silver nanorod arrays.
AUTHOR: Broglin, Brandy L. (Department of Chemistry University of North Carolina at Charlotte, Charlotte, NC 28223); Andreu, Aja; Dhussa, Neetu; Heath Jr., Jerry A.; Gerst, Jeff; Dudley, Bruce; Holland, David; El-Kouedi, Mahnaz
SOURCE: Langmuir v 23 n 8 Apr 10 2007 2007.p 4563-4568
SOURCE: Langmuir v 23 n 8 Apr 10 2007 2007.p 4563-4568
CODEN: LANGD5 ISSN: 0743-7463
PUBLICATION YEAR: 2007
DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English
AN 2007(18):9829 COMPENDEX
AB The effects of the local environment on surface-enhanced Raman scattering (SERS) spectra utilizing gold, silver, and gold/silver striped nanorod array substrates was investigated. The arrays were fabricated using an electrochemical metal deposition into an anodic aluminum oxide template. The analyte chosen for this study was p-nitroso-N,N-dimethylaniline (p-NDMA), which has an electronic structure that is highly sensitive to its surrounding environment. Changes in the peak positions and peak ratios were used to probe the influence of water and the striping pattern on the SERS signal of p-NDMA. We present the results of the fabrication and characterization of the nanorod array substrates, as well as SERS spectra of p-NDMA in both polar and nonpolar environments and SERS spectra on a variety of striped nanorod arrays. The Raman data suggests that the p-NDMA molecule exists in a more polarized state when bound to the gold as compared to the silver rods. We have attempted to use these differences to determine whether the SERS signal predominantly arises from the tips of the rods or from the interior of the array. \$CPY 2007 American Chemical Society. 34 Refs.

L5 ANSWER 2 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2007(20):6193 COMPENDEX
TITLE: Silicon nanowire arrays for label-free detection of DNA.
AUTHOR: Gao, Zhiqiang (Institute of Microelectronics, Singapore 117685, Singapore); Agarwal, Ajay; Trigg, Alastair D.; Singh, Navab; Fang, Cheng; Tung, Chih-Hang; Fan, Yi; Buddharaju, Kavitha D.; Kong, Jinming
SOURCE: Analytical Chemistry v 79 n 9 May 1 2007 2007.p 3291-3297
SOURCE: Analytical Chemistry v 79 n 9 May 1 2007 2007.p 3291-3297
CODEN: ANCHAM ISSN: 0003-2700
PUBLICATION YEAR: 2007
DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical
LANGUAGE: English
AN 2007(20):6193 COMPENDEX
AB Arrays of highly ordered n-type silicon nanowires (SiNW) are fabricated using complementary metal-oxide semi-conductor (CMOS) compatible technology, and their applications in biosensors are investigated. Peptide nucleic acid (PNA) capture probe-functionalized SiNW arrays show a concentration-dependent resistance change upon hybridization to complementary target DNA that is linear over a large dynamic range with a detection limit of 10 fM. As with other SiNW biosensing devices, the sensing mechanism can be understood in

terms of the change in charge density at the SiNW surface after hybridization, the so-called "field effect". The SiNW array biosensor discriminates satisfactorily against mismatched target DNA. It is also able to monitor directly the DNA hybridization event *in situ* and in real time. The SiNW array biosensor described here is ultrasensitive, non-radioactive, and more importantly, label-free, and is of particular importance to the development of gene expression profiling tools and point-of-care applications. \$CPY 2007 American Chemical Society. 32 Refs.

L5 ANSWER 3 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2007(39):8941 COMPENDEX
TITLE: Intercalating gold nanoparticles as universal labels for DNA detection.
AUTHOR: Mehrabi, Maryam (Department of Chemistry Liverpool University, Liverpool L69 7ZD, United Kingdom); Wilson, Robert
SOURCE: Small v 3 n 9 September 2007 2007.p 1491-1495
SOURCE: Small v 3 n 9 September 2007 2007.p 1491-1495
ISSN: 1613-6810 E-ISSN: 1613-6829
PUBLICATION YEAR: 2007
DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English
AN 2007(39):8941 COMPENDEX
AB A new class of universal label based on specific interaction between intercalating gold nanoparticles(GNPs) and double-stranded DNA and its use to identify multiple-target sequences and polymerase chain reaction (PCR) templates, has been discussed. A high-molecular-weight aminodextran was functionalized with the intercalator psoralen and a plurality of protected disulfide bonds, which was conjugated to citrate-stabilized GNPs. To confirm the potential of GNPs conjugated to psoralen intercalators as universal labels for double-stranded DNA, a series of microsphere assays were carried out for the single-stranded microbial target sequences. Single-stranded biotinylated capture probes complementary to these target sequences were conjugated to streptavidin-coated microspheres. This conjugation method can also be used to attach intercalators to other types of nanoparticles, such as those made from semiconductor and metal oxide materials.(Edited abstract) 36 Refs.

L5 ANSWER 4 OF 47 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2007:9283943 INSPEC
TITLE: Label-free immunodetection with CMOS-compatible semiconducting nanowires
AUTHOR: Stern, E.; (Dept. of Appl. Phys., Yale Univ., New Haven, CT, USA), Klemic, J.F.; Routenberg, D.A.; Wyrembak, P.N.; Turner-Evans, D.B.; Hamilton, A.D.; LaVan, D.A.; Fahmy, T.M.; Reed, M.A.
SOURCE: Nature (1 Feb. 2007), vol.445, no.7127, p. 519-22, 30 refs.
CODEN: NATUAS, ISSN: 0028-0836
SICI: 0028-0836(20070201)445:7127L.519:LFIW;1-3
Published by: Nature Publishing Group, UK
DOCUMENT TYPE: Journal
TREATMENT CODE: Experimental
COUNTRY: United Kingdom
LANGUAGE: English
AN 2007:9283943 INSPEC
AB Semiconducting nanowires have the potential to function as highly sensitive and selective sensors for the label-free detection of low concentrations of pathogenic microorganisms. Successful solution-phase nanowire sensing has been demonstrated for ions,

small molecules, proteins, DNA and viruses; however, 'bottom-up' nanowires (or similarly configured carbon nanotubes') used for these demonstrations require hybrid fabrication schemes, which result in severe integration issues that have hindered widespread application. Alternative 'top-down' fabrication methods of nanowire-like devices produce disappointing performance because of process-induced material and device degradation. Here we report an approach that uses complementary metal oxide semiconductor (CMOS) field effect transistor compatible technology and hence demonstrate the specific label-free detection of below 100 femtomolar concentrations of antibodies as well as real-time monitoring of the cellular immune response. This approach eliminates the need for hybrid methods and enables system-scale integration of these sensors with signal processing and information systems. Additionally, the ability to monitor antibody binding and sense the cellular immune response in real time with readily available technology should facilitate widespread diagnostic applications

L5 ANSWER 5 OF 47 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2007:9508640 INSPEC
TITLE: Application of magnetic and luminescent metal oxide particles to biosensors
AUTHOR: Nichkova, M. (Dept. of Entomology, Univ. of California, Davis, CA, USA), Dosev, D.; Ma, Z.; Gee, S.; Hammock, B.; Kennedy, I.
SOURCE: AIP Conference Proceedings (2007), vol.898, no.1, p. 93-8, 27 refs.
CODEN: APCPCS, ISSN: 0094-243X
SICI: 0094-243X(2007)898:1L.93:AMLM;1-G
Published by: AIP, USA
Conference: Water Dynamics: 4th International Workshop on Water Dynamics, Sendai, Japan, 7-8 Nov. 2006
DOCUMENT TYPE: Conference; Conference Article; Journal
TREATMENT CODE: Practical
COUNTRY: United States
LANGUAGE: English
AN 2007:9508640 INSPEC
AB Nanotechnology-based platforms for high-throughput, multiplexed detection of proteins and DNA promise to bring substantial advances in molecular medicine, environmental monitoring and security against terrorist attack. It is possible to replace current chip-based microarray technologies with nanoparticle-based technologies by shifting the immobilizing probe DNA or antibody from the surface of a chip to the surface of a nanoparticle. By incorporating magnetic properties and luminescent properties into the same particle, it is possible to manipulate these materials within tailored magnetic fields, and to achieve sensitive read-out by making use of the non-photobleaching properties of the base lanthanide particle. It is possible to synthesize a large range of uniquely encoded particles using a spray pyrolysis technique that has been perfected in our laboratory, with much greater ease than is offered by embedding quantum dots in polymer beads. In particular, we make use of the unique properties of lanthanide phosphors doped into suitable crystal hosts to synthesize particles with a wide range of ratios of different phosphor signals that encode for unique probe oligonucleotides or antibody probes.

L5 ANSWER 6 OF 47 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2007:9316825 INSPEC
TITLE: Electron orbital valves made of multiply connected armchair carbon nanotubes with mirror-reflection symmetry: tight-binding study
AUTHOR: Gunn Kim, Sang Bong Lee, Hoonkyung Lee, Ihm, J. (Center for Theor. Phys., Seoul Nat. Univ., South Korea)

SOURCE: Journal of Physics: Condensed Matter (17 Jan. 2007),
vol.19, no.2, p. 7 pp., 18 refs.
CODEN: JCOMEL, ISSN: 0953-8984
Price: 0953-8984/07/020001+07\$30.00
Doc.No.: S0953-8984(07)34077-0
Published by: IOP Publishing, UK

DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical
COUNTRY: United Kingdom
LANGUAGE: English

AN 2007:9316825 INSPEC

AB Using the tight-binding method and the Landauer-Buettiker conductance formalism, we demonstrate that a multiply connected armchair carbon nanotube with mirror-reflection symmetry can sustain an electron current of the π -bonding orbital while suppressing that of the π -antibonding orbital over a certain energy range. Accordingly, the system behaves like an electron orbital valve and it may be used as a scanning tunnelling microscope to probe pairing symmetry in d-wave superconductors or even orbital ordering in solids which is believed to occur in some transition-metal oxides

L5 ANSWER 7 OF 47 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2007:9427345 INSPEC

TITLE: Resolution enhancement in contact-type scanning nonlinear dielectric microscopy using a conductive carbon nanotube probe tip

AUTHOR: Ishikawa, K.; (Res. Inst. of Electr. Commun., Tohoku Univ., Sendai, Japan), Honda, K.; Cho, Y.

SOURCE: Nanotechnology (28 Feb. 2007), vol.18, no.8, p. 6 pp., 19 refs.
CODEN: NNOTER, ISSN: 0957-4484
Price: 0957-4484/07/084015+06\$30.00
Published by: IOP Publishing, UK

DOCUMENT TYPE: Journal
TREATMENT CODE: Practical; Experimental
COUNTRY: United Kingdom
LANGUAGE: English

AN 2007:9427345 INSPEC

AB The lateral resolution of a scanning nonlinear dielectric microscope (SNDM) depends on the tip radius. The contact-type SNDM has problems associated with tip abrasion and tip deformation. Thus, the use of an electro-conductive carbon nanotube (CNT) probe tip is expected to lead to improvements in resolution and durability. In the present paper, we employ a contact-type SNDM with a CNT probe to measure the ferroelectric domain wall of stoichiometric lithium tantalate (LiTaO_3), and similar SNDM measurements are performed with a platinum-coated probe for comparison. In addition, we observe the charge distribution accumulated in a floating gate (FG) type flash memory and the dopant profile of an n-channel metal-oxide-semiconductor field-effect transistor (MOSFET), respectively. By comparing the SNDM images obtained with the two probes, we demonstrate that the lateral resolution of the CNT probe is better than that of the conventional metal-coated probe

L5 ANSWER 8 OF 47 INSPEC (C) 2007 IET on STN DUPLICATE 1
ACCESSION NUMBER: 2007:9329386 INSPEC

TITLE: High response and stability in CO and humidity measures using a single SnO_2 nanowire

AUTHOR: Morante, J.R.; Hernandez-Ramirez, F.; Tarancón, A.; Casals, O.; Arbiol, J.; Romano-Rodríguez, A. (Dept. of Electron., Univ. of Barcelona, Spain)

SOURCE: Sensors and Actuators B (Chemical) (30 Jan. 2007),

vol.121, no.1, p. 3-17, 35 refs.
CODEN: SABCEB, ISSN: 0925-4005
SICI: 0925-4005(20070130)121:1L.3:HRSH;1-S
Doc.No.: S0925-4005(06)00619-8
Published by: Elsevier, Switzerland

DOCUMENT TYPE: Journal
TREATMENT CODE: Practical, Experimental
COUNTRY: Switzerland
LANGUAGE: English

AN 2007:9329386 INSPEC

AB Single SnO₂ metal oxide nanowires are used at the nanoscale level as individual monocrystal for the electrical transduction of the gas interaction with these sensing materials. Electrical contact characteristics and resistance variations under different gas ambient are analyzed from two- and four-probes measurements of individual nanowires. These data have allowed the estimation of their resistivities and contact resistances. At the gas sensor working conditions, AC impedance spectroscopy technique has extensively been applied to analyze the interaction with the gas molecules and study the influence of the nanowire diameter size on the electrical transduction processes. CO and humidity behaviors are reported for single SnO₂ nanowires with CO detection threshold smaller than 5ppm and measurement instability lower than 4%. [All rights reserved Elsevier]

L5 ANSWER 9 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN

ACCESSION NUMBER: 2007(14):3756 COMPENDEX
TITLE: Electron orbital valves made of multiply connected armchair carbon nanotubes with mirror-reflection symmetry: Tight-binding study.
AUTHOR: Kim, Gunn (Center for Theoretical Physics School of Physics and Astronomy Seoul National University, Seoul 151-747, South Korea); Lee, Sang Bong; Lee, Hoonkyung; Ihm, Jisoon
SOURCE: Journal of Physics Condensed Matter v 19 n 2 Jan 17 2007 2007.
SOURCE: Journal of Physics Condensed Matter v 19 n 2 Jan 17 2007 2007., arn: 026217

CODEN: JCOMEL ISSN: 0953-8984 E-ISSN: 1361-648X

PUBLICATION YEAR: 2007

DOCUMENT TYPE: Journal
TREATMENT CODE: Experimental
LANGUAGE: English

AN 2007(14):3756 COMPENDEX

AB Using the tight-binding method and the Landauer-Buttiker conductance formalism, we demonstrate that a multiply connected armchair carbon nanotube with mirror-reflection symmetry can sustain an electron current of the pi-bonding orbital while suppressing that of the pi-antibonding orbital over a certain energy range. Accordingly, the system behaves like an electron orbital valve and it may be used as a scanning tunnelling microscope to probe pairing symmetry in d-wave superconductors or even orbital ordering in solids which is believed to occur in some transition-metal oxides.

\$CPY IOP Publishing Ltd. 18 Refs.

L5 ANSWER 10 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN

ACCESSION NUMBER: 2007(14):2416 COMPENDEX
TITLE: Resolution enhancement in contact-type scanning nonlinear dielectric microscopy using a conductive carbon nanotube probe tip.
AUTHOR: Ishikawa, Kenya (Research Institute of Electrical Communication Tohoku University, Aoba-ku, Sendai 980-8577, Japan); Honda, Koichiro; Cho, Yasuo

SOURCE: Nanotechnology v 18 n 8 Feb 28 2007 2007.
SOURCE: Nanotechnology v 18 n 8 Feb 28 2007 2007., arn: 084015
CODEN: NNOTER ISSN: 0957-4484 E-ISSN: 1361-6528
PUBLICATION YEAR: 2007
DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical
LANGUAGE: English

AN 2007(14):2416 COMPENDEX

AB The lateral resolution of a scanning nonlinear dielectric microscope (SNDM) depends on the tip radius. The contact-type SNDM has problems associated with tip abrasion and tip deformation. Thus, the use of an electro-conductive carbon nanotube (CNT) probe tip is expected to lead to improvements in resolution and durability. In the present paper, we employ a contact-type SNDM with a CNT probe to measure the ferroelectric domain wall of stoichiometric lithium tantalate (LiTaO_3), and similar SNDM measurements are performed with a platinum-coated probe for comparison. In addition, we observe the charge distribution accumulated in a floating gate (FG) type flash memory and the dopant profile of an n-channel metal-oxide-semiconductor field-effect transistor (MOSFET), respectively. By comparing the SNDM images obtained with the two probes, we demonstrate that the lateral resolution of the CNT probe is better than that of the conventional metal-coated probe. \$CPY IOP Publishing Ltd. 19 Refs.

L5 ANSWER 11 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN

ACCESSION NUMBER: 2007(28):669 COMPENDEX
TITLE: Direct flame synthesis of carbon nanotubes on metal alloys and metal oxides.
AUTHOR: Xu, Fusheng (Department of Mechanical and Aerospace Engineering Rutgers University, Piscataway, NJ 08854); Zhao, Hong; Sun, Geliang; Tse, Stephen D.
MEETING TITLE: 44th AIAA Aerospace Sciences Meeting 2006.
MEETING LOCATION: Reno, NV, United States
MEETING DATE: 09 Jan 2006-12 Jan 2006
SOURCE: Collection of Technical Papers - 44th AIAA Aerospace Sciences Meeting v 24 2006.p 18208-18214
SOURCE: Collection of Technical Papers - 44th AIAA Aerospace Sciences Meeting v 24 2006.p 18208-18214
SOURCE: Collection of Technical Papers - 44th AIAA Aerospace Sciences Meeting
ISBN: 1563478072; 9781563478079
PUBLICATION YEAR: 2006
MEETING NUMBER: 69817
DOCUMENT TYPE: Conference Article
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English

AN 2007(28):669 COMPENDEX

AB Various morphologies of carbon nanotubes (CNTs) are grown catalytically on metal alloy probes and metal-oxide materials in counterflow diffusion flames using methane as fuel. It is found that multi-wall carbon nanotubes (MWNTs) are grown from metal-alloy probes while both MWNTs and single-wall carbon nanotubes (SWNTs) are obtained from the metal-oxide materials. CNT growth and morphologies are investigated as functions of local gas-phase temperatures, C-related species concentrations (e.g. C_2H_2 , CO), sampling positions, C_2H_2 adding to the fuel, and probe compositions. CNTs grow optimally in non-sooty regions of the flames. C_2H_2 addition is found to promote direct synthesis of vertically well-aligned MWNTs with uniform diameters from Ni/Cr/Fe. 22 Refs.

L5 ANSWER 12 OF 47 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 2

ACCESSION NUMBER: 2006:289461 CAPLUS
DOCUMENT NUMBER: 146:144313
TITLE: Enhancement of water-repellent performance on functional coating by using the Taguchi method
AUTHOR(S): Lin, Ta-Sen; Wu, Chu-Fu; Hsieh, Chien-Te
CORPORATE SOURCE: Institute of Technology Management, Chung-Hua University, Hsinchu, 300, Taiwan
SOURCE: Surface and Coatings Technology (2006), 200(18-19), 5253-5258
CODEN: SCTEEJ; ISSN: 0257-8972
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The enhancement is investigated of water-repellency on rough surfaces using nanoscale roughness inherent in metal-oxide nanoparticles together with a hydrophobic fluoroacrylic polymer (Zonyl 8740) coating via the Taguchi and anal. of variance (ANOVA) methodologies. Based on the concepts of nanocoating processing, seven operating factors including type of nanoparticle, solid ratio, dispersion time, F-binder ratio, distance between nozzle and substrate, spray direction and layer number can be considered. Through the Taguchi method, solid ratio plays the most significant role in affecting the ideal function and robust design of a water-repellent coating. Since surface roughness is generally influenced by solid ratio, more nanoparticles can randomly stack to build up a rougher surface, causing more air to be trapped on the nanostructured surface. This argument supported by the Cassie-Baxter equation indicates that the water droplet is partially sitting on an air film, capable of promoting the superhydrophobic behavior. The reconfirmation test using the optimal parameter settings demonstrates that the superhydrophobic surface can be achieved, and its contact angle is as high as 161.4°.

REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 13 OF 47 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2007:9396775 INSPEC
TITLE: The many faces of rutile titania
AUTHOR: Thornton, G.; Pang, C.L. (Chem. Dept., Univ. Coll. London, UK)
SOURCE: Surface Science (1 Oct. 2006), vol.600, no.19, p. 4405-6, 31 refs.
CODEN: SUSCAS, ISSN: 0039-6028
SICI: 0039-6028(20061001)600:19L.4405:MFRT;1-9
Doc.No.: S0039-6028(06)00819-3
Published by: Elsevier, Netherlands
DOCUMENT TYPE: Journal
TREATMENT CODE: Experimental
COUNTRY: Netherlands
LANGUAGE: English

AN 2007:9396775 INSPEC

AB The paper reviews the properties of rutile titania

L5 ANSWER 14 OF 47 INSPEC (C) 2007 IET on STN DUPLICATE 3
ACCESSION NUMBER: 2007:9235212 INSPEC
TITLE: Electrical contacts and gas sensing analysis of individual metal oxide nanowires and 3D nanocrystal networks
AUTHOR: Hernandez-Ramirez, F.; Tarancón, A.; Romano-Rodríguez, A.; Morante, J.R. (Dept. of Electron., Barcelona Univ., Spain)
SOURCE: Transactions of the Institute of Electrical Engineers of Japan, Part E (2006), vol.126-E, no.10, p. 537-47, 34 refs.

CODEN: DGREF9, ISSN: 1341-8939
SICI: 1341-8939(2006)126:E:10L.537:ECFA;1-F
Published by: Inst. Electr. Eng. Japan, Japan
DOCUMENT TYPE: Journal
TREATMENT CODE: Practical; Experimental
COUNTRY: Japan
LANGUAGE: Japanese
AN 2007:9235212 INSPEC
AB A nanolithography method based on the use of a dual beam focused-ion-beam (FIB) equipment to perform electrical contacts on either individual metal oxide nanowires or three-dimensional (3D) nanocrystal networks is reported. Both advantages and disadvantages of using this nanolithography process compared with other more conventional techniques are discussed. The possibility of using these FIB bottom-up devices in gas sensing application is also presented showing the performances of the gas sensors based on single nanowires and 3D nanocrystal networks of metal oxides. For it, two- and four-probe electrical measurements have been used determining the features associated to the contact resistances. To eliminate any influence of the contact values, AC impedance spectroscopy techniques have been adapted on individual nanowires facilitating the analysis of the gas sensing mechanisms in single metal oxide nanocrystal

L5 ANSWER 15 OF 47 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:437494 CAPLUS
DOCUMENT NUMBER: 147:62652
TITLE: Single crystal metal oxide nanowires as bio-chem sensing probes
AUTHOR(S): Gouma, P.; Bishop, A.; Iyer, K. K.
CORPORATE SOURCE: Dept of Materials Science & Engineering, State University of New York, Stony Brook, NY, 11794-2275, USA
SOURCE: Xiyou Jinshu Cailiao Yu Gongcheng (2006), 35(Suppl. 3), 295-298
CODEN: XJCGEA; ISSN: 1002-185X
PUBLISHER: Kexue Chubanshe
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Single crystal MoO₃ nanowires were produced using the electro-spinning technique. High resolution TEM (HRTEM) revealed that the 1-dimensional nanostructures are 10nm in diameter, .apprx.1 μm.apprx.2 μm in length, and have an orthorhombic structure. A nano-network of MoO₃ nanowires exhibits higher sensitivity and an n-type response to NH₃ as compared to the response of a traditional sol-gel sensor. The structure, crystallinity, and sensoric nature of these single-step processed nanowires are discussed.
REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 16 OF 47 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:726729 CAPLUS
DOCUMENT NUMBER: 145:366290
TITLE: A novel preparation of three-dimensionally ordered macroporous M/Ti (M = Zr or Ta) mixed oxide nanoparticles with enhanced photocatalytic activity
AUTHOR(S): Wang, Changhua; Geng, Aifang; Guo, Yihang; Jiang, Shujuan; Qu, Xuesong; Li, Li
CORPORATE SOURCE: Faculty of Chemistry, Northeast Normal University, Changchun, 130024, Peop. Rep. China
SOURCE: Journal of Colloid and Interface Science (2006), 301(1), 236-247
CODEN: JCISA5; ISSN: 0021-9797

PUBLISHER: Elsevier
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Three-dimensionally ordered macroporous (3 DOM) M/Ti (M = Zr or Ta) mixed oxides were prepared by co-hydrolysis of a mixture of Zr(n-OC₄H₉)₄/TTIP or TaCl₅/TTIP (TTIP = titanium isopropoxide) combined with a polystyrene (PS) latex sphere templating technique. The resulting products exhibited homogeneous wall compns., namely, Zr or Ta was uniformly dispersed into the TiO₂ framework with the loading levels of 5, 10, and 20 mol% for Zr and 2.5, 5.0, and 7.5 mol% for Ta, resp. The estimated macropore diameter,

wall thickness, and particle size of the products ranged from 280 to 290 nm, from 30 to 50 nm, and from 10 to 12 nm, resp. The products showed only anatase phase structure although their starting solitary metal oxides exhibited suitable crystalline structures under the same preparation conditions.

Raman scattering spectroscopy showed that the crystal structure of titania had a slight interference due to the incorporation of Zr or Ta, and UV-vis diffuse reflectance spectroscopy (DRS) showed the narrower band gap of the products compared with that of pure anatase TiO₂. The products exhibited mesoporous wall structures, and their BET surface areas were higher than those of the corresponding pure 3 DOM metal oxides. The UV-light photocatalytic activity of the products was assessed by monitoring the photodegrdn. of two organic mols. including 4-nitrophenol (4-NP) and Rhodamine B (RB). Both the photocatalytic reactions confirmed that the presence of the second metal oxide in the titania framework resulted in enhanced photocatalytic activity compared with the pure titania framework.

REFERENCE COUNT: 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 17 OF 47 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2007:9359240 INSPEC
TITLE: Magnetization damping in two-component metal oxide micropowder and nanopowder compacts by broadband ferromagnetic resonance measurements
AUTHOR: Youssef, J.B.; (Lab. de Magnetisme de Bretagne, Univ. de Bretagne Occidentale, Brest, France), Brosseau, C.
SOURCE: Physical Review B (Condensed Matter and Materials Physics) (1 Dec. 2006), vol.74, no.21, p. 214413-1-13, 81 refs.
CODEN: PRBMDO, ISSN: 1098-0121
SICI: 1098-0121(20061201)74:21L.214413:MDCM;1-M
Price: 0163-1829/2006/74(21)/214413(13) /\$22.50
Doc.No.: S0163-1829(06)05945-5
Published by: APS through AIP, USA
DOCUMENT TYPE: Journal
TREATMENT CODE: Experimental
COUNTRY: United States
LANGUAGE: English

AN 2007:9359240 INSPEC
AB The microwave damping mechanisms in magnetic inhomogeneous systems have displayed a richness of phenomenology that has attracted widespread interest over the years. Motivated by recent experiments, we report an extensive experimental study of the Gilbert damping parameter of multicomponent metal oxides micro- and nanophases. We label the former by M samples, and the latter by N samples. The main thrust of this examination is the magnetization dynamics in systems composed of mixtures of magnetic (γ -Fe₂O₃) and nonmagnetic (ZnO and epoxy resin) materials fabricated via powder processing. Detailed ferromagnetic resonance (FMR) measurements on N and M samples are described so to determine changes in the microwave absorption over the 6-18 GHz frequency range as a function of composition and static magnetic field. The FMR linewidth and the field dependent resonance were measured

for the M and N samples, at a given volume fraction of the magnetic phase. The asymmetry in the form and change in the linewidth for the M samples are caused by the orientation distribution of the local anisotropy fields, whereas the results for the N samples suggest that the linewidth is very sensitive to details of the spatial magnetic inhomogeneities. For N samples, the peak-to-peak linewidth increases continuously with the volume content of magnetic material. The influence of the volume fraction of the magnetic phase on the static internal field was also investigated. Furthermore, important insights are gleaned through analysis of the interrelationship between effective permeability and Gilbert damping constant. Different mechanisms have been considered to explain the FMR linewidth: the intrinsic Gilbert damping, the broadening induced by the magnetic inhomogeneities, and the extrinsic magnetic relaxation. We observed that the effective Gilbert damping constant of the series of N samples are found to be substantially smaller in comparison to M samples. This effect is attributed to the surface anisotropy contribution to the anisotropy of Fe₂O₃ nanoparticles. From these measurements, the characteristic intrinsic damping dependent on the selected material and the damping due to surface/interface effects and interparticle interaction were estimated. The inhomogeneous linewidth (damping) due to surface/interface effects decreases with diminishing particle size, whereas the homogeneous linewidth (damping) due to interactions increases with increasing volume fraction of magnetic particles (i.e., reducing the separation between neighboring magnetic phases) in the composite

L5 ANSWER 18 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN

ACCESSION NUMBER: 2006(48):3608 COMPENDEX
TITLE: Integrating aligned nanorod array onto optical fibers for SERS probes.
AUTHOR: Fan, J.-G. (Nanoscale Science and Engineering Center Department of Physics and Astronomy University of Georgia, Athens, GA 30602); Liu, Y.-J.; Zhao, Y.-P.
MEETING TITLE: Nanoengineering: Fabrication, Properties, Optics, and Devices III.
MEETING ORGANIZER: SPIE
MEETING LOCATION: San Diego, CA, United States
MEETING DATE: 15 Aug 2006-17 Aug 2006
SOURCE: Proceedings of SPIE - The International Society for Optical Engineering v 6327 2006.
SOURCE: Proceedings of SPIE - The International Society for Optical Engineering v 6327 2006., arn: 63270R
SOURCE: Nanoengineering: Fabrication, Properties, Optics, and Devices III
CODEN: PSISDG ISSN: 0277-786X
PUBLICATION YEAR: 2006
MEETING NUMBER: 68576
DOCUMENT TYPE: Conference Article
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English
AN 2006(48):3608 COMPENDEX
AB The use of fiber optics can greatly reduce device size while maintaining the sensitivity. Recently, nanostructures, especially metallic nanoparticles, have been incorporated into fiber optical sensors to obtain high sensitivity and specificity. Here, we propose a new way to integrate aligned nanorods onto optical fibers using a modified oblique angle deposition (OAD) technique. By rotating the optical fiber with a proper tilting angle, aligned nanorods from materials such as metals, semiconductors and metal oxides have been successfully deposited. With a slight modification, multi-layer film/nanorod and nanorod/nanorod structures have also been demonstrated. This method has the advantage to coat aligned nanorods on optical fibers at low

temperature, and is particularly promising for preparing nanostructured fiber optical probes for sensor applications. We also demonstrate that the optical fiber with its tip coated with Ag nanorod arrays can act as a Surface Enhance Raman Scattering (SERS) sensor. 20 Refs.

L5 ANSWER 19 OF 47 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:453690 CAPLUS
DOCUMENT NUMBER: 142:467886
TITLE: Tagging of manufactured articles by addition of up-/down-converting rare-earth-doped metal oxide nanophosphors
INVENTOR(S): Berger, Gerald; Laine, Richard M.; Azurdia, Jose
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 8 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2005112360	A1	20050526	US 2003-723709	20031126
PRIORITY APPLN. INFO.:			US 2003-723709	20031126

AB Manufactured articles are rendered identifiable as to their source or genuineness by incorporating one or more of up- and/or down-converting metal oxide or mixed metal oxides (such as Er-/Tm-/Yb-doped yttria) during or post manufacture. The phosphor nanoparticles exhibit emission of light upon irradiation by energy sources which allows comparison between the emission spectrum of an article with the emission expected of a genuine article or a material from a given manufacturing process such as a batch of material.

L5 ANSWER 20 OF 47 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2005:8609960 INSPEC
DOCUMENT NUMBER: B2005-12-2230F-002
TITLE: A quantum-mechanical treatment of phonon scattering in carbon nanotube transistors
AUTHOR: Jing Guo (Dept. of Electr. & Comput. Eng., Univ. of Florida, Gainesville, FL, USA)
SOURCE: Journal of Applied Physics (15 Sept. 2005), vol.98, no.6, p. 63519-1-6, 24 refs.
CODEN: JAPIAU, ISSN: 0021-8979
SICI: 0021-8979(20050915)98:6L.63519:QMTP;1-P
Price: 0021-8979/2005/98(6)/063519-1(6)/\$22.50
Doc.No.: S0021-8979(05)07618-8
Published by: AIP, USA
DOCUMENT TYPE: Journal
TREATMENT CODE: Practical; Theoretical
COUNTRY: United States
LANGUAGE: English

AN 2005:8609960 INSPEC DN B2005-12-2230F-002
AB Phonon scattering in carbon nanotube field-effect transistors (CNTFETs) is treated using the nonequilibrium Green's function formalism with the self-consistent Born approximation. The treatment simultaneously captures the essential physics of phonon scattering and important quantum effects. For a one-dimensional channel, it is computationally as efficient as and physically more rigorous than the so-called 'Buttiker probe' approach [Phys. Rev. Lett. 57, 1761 (1986)], which has been widely used in mesoscopic physics. The non-self-consistent simulation results confirm that the short mean-free-path optical phonon (OP) scattering, though expected to dominate even in a short channel CNTFET, essentially has no direct effect on the dc on current under

modest gate biases. The self-consistent simulation results indicate that OP scattering, however, can have an indirect effect on the on current through self-consistent electrostatics. Using a high- κ gate insulator suppresses the indirect effect and leads to a dc on current closer to the ballistic limit. The indirect effect in a CNT Schottky barrier FET can be more important than that in a metal-oxide semiconductor FET

L5 ANSWER 21 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2006(16):9550 COMPENDEX
TITLE: Using photoelectrochemical probes to investigate the pore accessibility in surfactant-templated ordered mesoporous thin films.
AUTHOR: Urade, Vikrant N.; Hillhouse, Hugh W.
MEETING TITLE: 05AIChE: 2005 AIChE Annual Meeting and Fall Showcase.
MEETING LOCATION: Cincinnati, OH, United States
MEETING DATE: 30 Oct 2005-04 Nov 2005
SOURCE: AIChE Annual Meeting, Conference Proceedings 2005.p
13772
SOURCE: AIChE Annual Meeting, Conference Proceedings 2005.p
13772
SOURCE: 05AIChE: 2005 AIChE Annual Meeting and Fall Showcase, Conference Proceedings
PUBLICATION YEAR: 2005
MEETING NUMBER: 66925
DOCUMENT TYPE: Conference Article
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English

AN 2006(16):9550 COMPENDEX

AB Surfactant templated mesoporous materials¹ have received a lot of attention in the scientific community for their potential applications in catalysis, adsorption and separations. Recently, novel applications of non-silica mesoporous metal oxides such as TiO₂, SnO₂ and ZnO in photovoltaics and photocatalysis have attracted a great deal of synthesis effort to create novel architectures of these metal oxides.² However, in order to realize their use in devices such as dye sensitized solar cells, gas sensors and as templates for electrodeposition to create nanocomposite materials, it is essential that the pore systems in these materials be accessible to the species of interest (e.g. dye molecules). Here we report our investigations into the accessibility of the pore systems in block copolymer templated ordered mesoporous TiO₂ and SnO₂ thin films using organic molecules as probes. Photogenerated holes in both TiO₂ and SnO₂ are very strong oxidizing agents.³ The use of TiO₂-based materials (nanoparticles, films) for photo-oxidation of organic molecules has been well-documented in the literature.^{3,4} Here we use organic molecules as probes to determine the area accessible for photooxidation. Organic molecules are first adsorbed on both porous and non-porous metal oxide thin films. Then the films are transferred to a photoelectrochemical cell and the organic molecules are oxidized by illuminating the films with UV radiation. The photocurrent resulting from the oxidation of the organic molecules is measured to get the amount of the probe adsorbed on the metal oxide surface. This method allows one to determine the adsorption isotherms for organic probes on metal oxide surfaces and obtain the amount required for monolayer coverage.⁴ Thus, a quantitative estimate of the accessible photoactive area can be made. A good estimate of the cut-off size of the pores for the organic molecules can be made by measuring the adsorption isotherms for probes of different sizes. 6 Refs.

L5 ANSWER 22 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2006(16):9375 COMPENDEX

TITLE: Characterization and kinetic evaluation of dendrimer-derived bimetallic catalysts for the selective hydrogenation of 3,4-epoxy-1-butene.

AUTHOR: Liu, Dongxia; Monnier, John; Williams, Christopher T.

MEETING TITLE: 05AIChE: 2005 AIChE Annual Meeting and Fall Showcase.

MEETING LOCATION: Cincinnati, OH, United States

MEETING DATE: 30 Oct 2005-04 Nov 2005

SOURCE: AIChE Annual Meeting, Conference Proceedings 2005.p
11602

SOURCE: AIChE Annual Meeting, Conference Proceedings 2005.p
11602

SOURCE: 05AIChE: 2005 AIChE Annual Meeting and Fall Showcase, Conference Proceedings

PUBLICATION YEAR: 2005

MEETING NUMBER: 66925

DOCUMENT TYPE: Conference Article

TREATMENT CODE: Experimental

LANGUAGE: English

AN 2006(16):9375 COMPENDEX

AB We have been developing a new synthetic approach for heterogeneous catalysts involving the rational "atom-up" design and fabrication of dendrimer-stabilized nanoparticles immobilized on conventional catalyst supports. Hydroxyl-terminated polyamidoamine (PAMAM) dendrimers are spherical hyperbranched polymers containing repeating amine-amide branching units. They provide an ideal environment for trapping guest species, and this property can be utilized in the preparation of metal nanoparticles and supported metal catalysts. The catalyst synthesis process involves four steps: complexation of the metal ions with the dendrimer amine groups, reduction of the metal ions to obtain dendrimer-encapsulated metal nanoparticles, deposition of the metal-dendrimer nanocomposites onto an oxide support, and removal of the dendrimer "shell" by thermal treatment. Bimetallic Pt-X (X = Ru, Pd) have been synthesized via the dendrimer method following either co-complexation/co-reduction or sequential complexation/reduction protocols. These materials have been characterized by CO chemisorption, FTIR studies of probe molecules, and high resolution transmission electron microscopy (HRTEM), including energy dispersive X-ray (EDX) analysis. Furthermore, the kinetic trends have been investigated for the selective hydrogenation of 3,4-epoxy-1-butene (EpB). In several cases, the dendrimer-derived catalysts demonstrate clearly different (and in some cases enhanced) catalytic behavior compared with materials prepared from traditional wet impregnation of metal salts. The implications of these findings, as well as future directions of this research will be discussed.

L5 ANSWER 23 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN

ACCESSION NUMBER: 2006(17):8125 COMPENDEX

TITLE: Electrochemically fabricated nanostructures for chemical and biological sensing.

AUTHOR: Ramanathan, Kumaran (Department of Chemical and Environmental Engineering Center for Nanoscale Science and Engineering University of California, Riverside, CA 92521, United States); Bangar, Mangesh; Hangartner, Carlos; Wanekaya, Adam K.; Chen, Wilfred; Myung, Nosang; Mulchandani, Ashok

MEETING TITLE: 208th Meeting of The Electrochemical Society.

MEETING LOCATION: Los Angeles, CA, United States

MEETING DATE: 16 Oct 2005-21 Oct 2005

SOURCE: Meeting Abstracts v MA 2005-02 2005.p 1183

SOURCE: Meeting Abstracts v MA 2005-02 2005.p 1183

SOURCE: 208th Meeting of The Electrochemical Society - Meeting Abstracts

ISSN: 1091-8213

PUBLICATION YEAR: 2005
MEETING NUMBER: 67008
DOCUMENT TYPE: Conference Article
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English
AN 2006(17):8125 COMPENDEX
AB One-dimensional (1-D) nanostructures such as nanowires and nanotubes, configured as field-effect transistors (FETs) that change conductance upon binding of charged macromolecules to receptors linked to the device surfaces are extremely attractive for nanobioelectronics. Combined with simple, rapid and label-free detection, potentially to single molecule, these nanosensors are also attractive due to the small size, low power requirement and most of all possibility of developing high density arrays for simultaneous analyses of multiple species. Electrochemistry provides a simple technique for fabricating 1-D structures of variety of materials, including metals, conducting polymers and metal oxides.
. We have developed two different approaches for fabricating 1-D nanostructures for use as gate of FETs for sensor applications. The first method uses an insitu technique of electrodeposition within e-beam lithographically patterned electrolyte channels between two contact electrodes. Using this technique we have fabricated metallic, conducting polymers and biologically-functionalized conducting polymers nanowires of large aspect ratio as gate of the FETs for sensors.1,2 The second method utilizes template directed electrochemical synthesis of segmented nanowires with functional middle and ferromagnetic ends. The nanowires were aligned with an external magnetic field to control directionality to form the gate of the FETs for sensors. Effects of monomer concentration, dopant type and concentration and electrochemical polymerization mode on the sensitivity, selectivity and durability of biomolecule-functionalized conducting polymer coated CNTs as label-free bioaffinity sensors will be investigated to establish optimum fabrication and analysis protocols. 2 Refs.

L5 ANSWER 24 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2006(8):9399 COMPENDEX
TITLE: Functionalization and dissolution of Single-Wall Carbon Nanotubes by chemical-physical and electrochemical treatments: A FT-IR study.
AUTHOR: Curulli, A. (ISMN CNR, 00161 Rome, Italy); Valentini, F.; Cesaro, S. Nunziante; Coppe, A.; Silvestri, C.; Palleschi, G.
MEETING TITLE: 207th Meeting of the Electrochemical Society.
MEETING LOCATION: Quebec, Canada
MEETING DATE: 15 May 2005-20 May 2005
SOURCE: Meeting Abstracts 2005.p 997
SOURCE: Meeting Abstracts 2005.p 997
SOURCE: 207th Meeting of the Electrochemical Society - Meeting Abstracts
ISSN: 1091-8213
PUBLICATION YEAR: 2005
MEETING NUMBER: 66443
DOCUMENT TYPE: Conference Article
TREATMENT CODE: Experimental
LANGUAGE: English
AN 2006(8):9399 COMPENDEX
AB Single-Wall Carbon Nanotubes (SWCNTs) have demonstrated a wealth of exceptional structural¹, mechanical², and electronic properties³, which have made them potentially useful for applications in nanotube-reinforced materials⁴, nanoelectronic devices⁵, field emitters⁶, and probe tips for SPM⁷, and also for sensors⁸, biosensors⁹ and actuators. However, manipulation and processing of SWCNTs has been limited by their insolubility in most common solvents, although some dissolution

has recently been obtained. Considerable effort has therefore been devoted to the chemical modification and derivation of carbon nanotubes, which might pave the way to many useful applications, including composite preparations, enzyme and biological molecules immobilization (for biosensor and electrochemical sensor applications). Attachment of oxygen functional groups (i.e., carboxylic, carbonyl, hydroxyl, quinone, lactone, phenol, etc.) on the carbon nanotubes surface could be achieved using different pretreatment of nanostructured materials, as 1. Chemical and physical procedures; 2. Electrochemical activations. The first, involved a chemical oxidation of nanostructured powder by various oxidizing agents, as: HNO₃, HNO₃/H₂SO₄, H₂O₂, and KOH. Instead, physical treatments consisted in an air oxidation at + 400 deg C for 1 h (annealing), and then the oxidized amount of carbon nanotubes was dispersed in HCl₂O to eliminate the metal oxide catalysts. The electrochemical techniques of SWCNTs were performed by Chronoamperometry. Preanodization treatments were carried out on carbon nanotube electrodes using two different supporting electrolytes as: H₂SO₄ and NaOH at different applied potential for different time. In this work we described several treatments of the SWCNTs using chemical oxidations and electrochemical pre-treatments. The treated SWCNTs were studied by FTIR spectroscopic technique, which represents a typical method used to characterize chemically modified carbon nanotubes. The chemical treatment by KOH resulted the best procedure to solubilized and functionalized carbon nanotubes producing Single-Wall Carbon Nanotubols (SWNTols), which are soluble in water and can be ready self-assembled into compact aligned arrays. 9 Refs.

L5 ANSWER 25 OF 47 INSPEC (C) 2007 IET on STN DUPLICATE 4
ACCESSION NUMBER: 2005:8479793 INSPEC
DOCUMENT NUMBER: A2005-16-8116-012
TITLE: Direct deposition of aligned nanorod array onto cylindrical objects
AUTHOR: Fan, J.-G.; Zhao, Y.-P. (Dept. of Phys. & Astron., Univ. of Georgia, Athens, GA, USA)
SOURCE: Journal of Vacuum Science & Technology B (Microelectronics and Nanometer Structures) (May 2005), vol.23, no.3, p. 947-53, 31 refs.
CODEN: JVTBD9, ISSN: 1071-1023
SICI: 1071-1023(200505)23:3L.947:DDAN;1-0
Price: 0734-211X/2005/23(3)/947(7)/\$22.00
Doc.No.: S0734-211X(05)07103-9
Published by: AIP for American Vacuum Soc, USA
DOCUMENT TYPE: Journal
TREATMENT CODE: Practical; Experimental
COUNTRY: United States
LANGUAGE: English
AN 2005:8479793 INSPEC DN A2005-16-8116-012
AB A simple and robust method is developed for directly depositing aligned and well separated nanorod arrays onto cylindrical objects based on oblique angle deposition. By rotating the uniform or tapered cylindrical object such as optical fiber with a proper tilting angle, aligned nanorods from materials such as metals, semiconductors, and metal oxides have been successfully deposited. With a slight modification, multilayer film/nanorod and nanorod/nanorod structures have also been demonstrated. This method has the advantage of being able to coat aligned nanorods on cylindrical objects at low temperature, and it is particularly promising for preparing nanostructured fiber optical probes for sensor applications

L5 ANSWER 26 OF 47 INSPEC (C) 2007 IET on STN DUPLICATE 5
ACCESSION NUMBER: 2006:8718943 INSPEC
TITLE: Nanoengineered silicon/silicon dioxide nanoparticle

AUTHOR: heterostructures
Ostraat, M.L.; (Dept. of Chem. Eng., California Inst. of Technol., Pasadena, CA, USA), Brongersma, M.; Atwater, H.A.; Flagan, R.C.

SOURCE: Solid State Sciences (July 2005), vol.7, no.7, p. 882-90, 25 refs.
CODEN: SSSCFJ, ISSN: 1293-2558
SICI: 1293-2558(200507)7:7L.882:NSSD;1-G
Doc.No.: S1293-2558(05)00045-2
Published by: Editions Scientifiques et Medicales Elsevier, France

DOCUMENT TYPE: Journal
TREATMENT CODE: Practical; Experimental
COUNTRY: France
LANGUAGE: English

AN 2006:8718943 INSPEC

AB Engineering control of nanostructures is becoming increasingly important as nanotechnology applications develop and as device features shrink. In many nanotechnology-driven applications, bottoms-up fabrication of devices offers many inherent advantages over conventional top-down approaches typically employed today. In order to be commercially viable, bottoms-up fabrication methodologies must rely upon the synthesis and assembly of nanoengineered structures. The silicon nanoparticle-based floating-gate metal-oxide -semiconductor field effect transistor is an example of a device that incorporates nanostructures and is an attractive candidate for terabit cm⁻² density nonvolatile memory applications. However, variability in the size, location, and interface electronic quality of the nanoparticles in an ensemble limits device performance. To reduce device variability, the Si nanoparticle layer can be fabricated using a bottoms-up approach. Aerosol Si nanoparticles are synthesized by thermal decomposition of silane gas in a reactor optimized to produce spherical, single-crystal, nonagglomerated nanoparticles. The aerosol nanoparticles are size-classified with a differential mobility analyzer to produce narrow size distributions. Uniform oxide layers in the nanometer thickness range are then formed on the Si nanoparticles, either by thermal oxidation or by aerosol vapor phase tetraethylorthosilicate deposition. Electronic measurements indicate that high temperature thermal SiO₂ and deposited tetraethylorthosilicate-derived SiO₂ form shells of sufficient quality and thickness to isolate electrically adjacent nanoparticles from each other. Photoluminescence measurements used to probe the Si/SiO₂ interface indicate the presence of a high quality interface between deposited tetraethylorthosilicate oxide and Si nanoparticles. [All rights reserved Elsevier]

L5 ANSWER 27 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2006(17):7904 COMPENDEX

TITLE: Enhancement of water-repellent performance on functional coating by using the Taguchi method.

AUTHOR: Lin, Ta-Sen (Materials Research Laboratories Industrial Technology Research Institute, Hsinchu 310, Taiwan); Wu, Chu-Fu; Hsieh, Chien-Te

MEETING TITLE: 208th Meeting of The Electrochemical Society.

MEETING LOCATION: Los Angeles, CA, United States

MEETING DATE: 16 Oct 2005-21 Oct 2005

SOURCE: Meeting Abstracts v MA 2005-02 2005.p 598

SOURCE: Meeting Abstracts v MA 2005-02 2005.p 598

SOURCE: 208th Meeting of The Electrochemical Society - Meeting Abstracts

PUBLICATION YEAR: 2005

MEETING NUMBER: 67008

DOCUMENT TYPE: Conference Article
TREATMENT CODE: Theoretical
LANGUAGE: English
AN 2006(17):7904 COMPENDEX
AB The present work investigates the enhancement of water-repellency on rough surfaces using nanoscale roughness inherent in metal-oxide nanoparticles together with a hydrophobic fluoromethylc copolymer coating via the Taguchi and analysis of variance (ANOVA) methodologies. Based on the construction of nanocoating processing, seven operating factors including type of nanoparticle, solid ratio, dispersion time, F-binder ratio, distance between nozzle and substrate, spray direction and layer number, can be considered. Through the Taguchi method, solid ratio plays the most significance in affecting the ideal function and robust design of water-repellent coating. Since surface roughness is generally influenced by solid ratio, more nanoparticles can randomly stack to build up a rougher surface, causing more air can be trapped on the nanostructured surface. This argument supported by the Cassie-Baxter equation indicates that the water droplet is partially sitting on air film, capable of promoting the superhydrophobic behavior. The reconfirmation test using the optimal parameter settings demonstrates that the superhydrophobic surface can be achieved, and its contact angle is as high as 161.4deg .

L5 ANSWER 28 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2006(17):7817 COMPENDEX
TITLE: Electron microscopy contributions to the characterization and performance improvement of anode and cathode active materials in the design of better lithium ion batteries.
AUTHOR: Dupont, Loic (LRCS UPJV UMR CNRS 6007, 80039 Amiens cedex, France); Grugeon, Sylvie; Laruelle, Stephane; Debart, Aurelie; Morcrette, Mathieu; Tarascon, Jean-Marie
MEETING TITLE: 208th Meeting of The Electrochemical Society.
MEETING LOCATION: Los Angeles, CA, United States
MEETING DATE: 16 Oct 2005-21 Oct 2005
SOURCE: Meeting Abstracts v MA 2005-02 2005.p 226
SOURCE: Meeting Abstracts v MA 2005-02 2005.p 226
SOURCE: 208th Meeting of The Electrochemical Society - Meeting Abstracts
ISSN: 1091-8213
PUBLICATION YEAR: 2005
MEETING NUMBER: 67008
DOCUMENT TYPE: Conference Article
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English
AN 2006(17):7817 COMPENDEX
AB Batteries performances depend on many factors amongst which the most critical are the selection/synthesis of the appropriate electrode material and the control of the electrode/electrolyte interface upon cycling. In order to address these issues, electrochemists have to design new electrode materials, to finely tune the electrode texture for maximum electrochemical efficiency, to spot interfacial modifications/growing layers or, in short, to 'enter the private life' of a battery. Electron Microscopy is a powerful tool to help scientists throughout these different steps. This point will be exemplified with descriptive examples selected from our recent works on electrode materials reacting without alloying or insertion of lithium. Two different types of mechanism will be studied: Conversion Reaction1 for most of transition metal compounds (oxides, nitrides, borates, fluorides, sulphides), with the decomposition of a transition metal oxide into metallic nanograins embedded in a lithiated matrix during discharge,

and the re-oxidation of the so-formed nanoparticles during the following charge. Displacement Reaction 2-3 for Cu-based materials or, in general, materials having high mobility cations that react with Li through reversible Li-driven extrusion/insertion of cations upon cycling. These promising results could enable a breakthrough in the performance improvement of future batteries. Indeed, while classical Li insertion/de-insertion reactions are limited to 1e- per 3d-metal, conversion or displacement reactions involve up to 3 or 4e- per 3d-metal. Another attractive aspect is that the potential of these conversion reactions depends on the ionocovalence of the M-X bonding, and therefore can be tuned into a continuous line from 0 to 3 V by changing the nature of the anion X, with the highest potential obtained for fluorides, as recently demonstrated with fluoride materials. In parallel, to benefit from the large capacity offered by Li-driven conversion reactions, new electrode configuration should be designed in order to get over the poor kinetics of bulk materials. Most of the tested design deals with electrodes made of nano-materials that could not easily be characterized using classic techniques such as XRD. Nanoscale analytic probe of Field Emission Gun High Resolution Transmission Electron Microscope is used to help with characterizing theses electrodes. An example of original electrode design that could efficiently marry the current collectors with nanometric binary oxides will be shown during the presentation. 4 Refs.

L5 ANSWER 29 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2006(8):6958 COMPENDEX
TITLE: Nanotemplating of deposition processes.
AUTHOR: Hepel, Maria (Department of Chemistry State University of New York at Potsdam, Potsdam, NY 13676, United States); Kumarihamy, Lumbini D.
MEETING TITLE: 207th Meeting of the Electrochemical Society.
MEETING LOCATION: Quebec, Canada
MEETING DATE: 15 May 2005-20 May 2005
SOURCE: Meeting Abstracts 2005.p 88
SOURCE: Meeting Abstracts 2005.p 88
SOURCE: 207th Meeting of the Electrochemical Society - Meeting Abstracts
ISSN: 1091-8213
PUBLICATION YEAR: 2005
MEETING NUMBER: 66443
DOCUMENT TYPE: Conference Article
TREATMENT CODE: Theoretical
LANGUAGE: English
AN 2006(8):6958 COMPENDEX
AB Nanoscale devices with individually addressed elements of arrays have been extensively studied since they bring a critical step in design of integrated high speed and high capacity architectures for computing and chemical and biological sensor development¹⁻⁵. The active elements, such as molecular field-effect transistors, must have a massively expanded connectivity realized by nanowires with high electron mobility. Various concepts in nanowiring have been explored including metal, carbon nanotubes, conductive polymers, etc. We have studied molecularly templated deposition of metals in the form of nanowires. Templates were formed by microcontact printing or by micromechanical manipulation of adsorbed organic molecules using nanoactuators. The surface accessibility through molecular templates was tested using adatom probe method. The nanowires deposited by molecular templating were subsequently imaged using AFM and STM. The method allowed also deposit nanostructured metal oxide semiconductors, such as TiO₂ and WO₃, and conductive polymers (PPy) in small spots, 100-500 nm. The nanowires and conductive polymer spots can be deposited on top of Si wafer structures forming photosensors or memory devices. The molecular templating employed was based on studies of conformational transitions in thin films of biomolecules and

comparative interactions with different metals. The aim of this project has been to develop an array of microsensors able to detect and quantify a range of pollutants and toxic substances. We have succeeded with large area highly specific sensors 6,7 for PCB and herbicide 2,4-D, based on monoclonal antibodies, and developed sensors for heavy metals. 7 Refs.

L5 ANSWER 30 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2005(52):4924 COMPENDEX
TITLE: Towards the integration of carbon nanostructures into CMOS technology.
AUTHOR: Kabir, Mohammad Shafiqul (Department of Microtechnology and Nanoscience (MC2) Solid State Electronics Laboratory Chalmers University of Technology, Goteborg, Sweden)
SOURCE: Doktorsavhandlingar vid Chalmers Tekniska Hogskola n 2330 2005.p 1-73
SOURCE: Doktorsavhandlingar vid Chalmers Tekniska Hogskola n 2330 2005.p 1-73
CODEN: DCTHAT ISSN: 0346-718X
PUBLICATION YEAR: 2005
DOCUMENT TYPE: Journal
TREATMENT CODE: Bibliography; Theoretical
LANGUAGE: English
AN 2005(52):4924 COMPENDEX
AB Relentless efforts for miniaturization of traditional complementary metal oxide semiconductor (CMOS) devices have reached the limit where the device characteristics are governed by quantum phenomena which are difficult to control. This engendered a need for finding alternative new materials that can be engineered to fabricate devices that will possess at least the same or even better performance than existing CMOS devices. The choices of new material(s) is however limited by factors like production compatibility, reproducibility and cost efficiency. The scientific endeavor made in this thesis was focused on the technological requirements and issues related to integration of novel materials into a CMOS platform and developing potential solutions to some of the technological difficulties. Front end technology developed in this work includes interfacing molecules, gold clusters and carbon nanotubes. We have explored the quasi one-dimensional nature of these materials in combination with e. g. self assembling techniques, surface treatments, nanolithography and the scanning probe technique. A general understanding derived from the device characteristics is that the electrical characteristics of an electronic nano-device not only depends on the intrinsic properties of the materials but is also strongly correlated with the method of device fabrication. Probing the intrinsic property of the material is challenging since the interface between the material and the microscopic leads governs the device characteristics. The technological development of the vertical growth of the carbon nanofibers (CNFs) presented in this work is applicable to tackle the technological difficulties envisaged for the back end technology beyond the year 2010. At the early stage of the work technology was developed to selectively grow CNF on a silicon substrate with diverse topography. Extending the same technology towards CMOS integration faced problem with growth on candidate metals. The challenge was met by introducing a thin layer of a-Si as a part of the catalyst layer which actually boosted the growth on Pt, Pd, W and Mo metal underlayers. However the problem remains for Ti and Cr metal underlayers which is in apparent contradiction to results obtained by other groups. The developed technology can be explored to fabricated vertical nanorelay devices or electrochemical probes. 171 Refs.

L5 ANSWER 31 OF 47 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2005(42):2359 COMPENDEX
TITLE: A quantum-mechanical treatment of phonon scattering in

AUTHOR: carbon nanotube transistors.
Guo, Jing
SOURCE: Journal of Applied Physics v 98 n 6 Sep 15 2005 2005.p
1-6
SOURCE: Journal of Applied Physics v 98 n 6 Sep 15 2005 2005.p
1-6
CODEN: JAPIAU ISSN: 0021-8979
PUBLICATION YEAR: 2005
DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English

AN 2005(42):2359 COMPENDEX

AB Phonon scattering in carbon nanotube field-effect transistors (CNTFETs) is treated using the nonequilibrium Green's function formalism with the self-consistent Born approximation. The treatment simultaneously captures the essential physics of phonon scattering and important quantum effects. For a one-dimensional channel, it is computationally as efficient as and physically more rigorous than the so-called "Buttiker probe" approach [Phys. Rev. Lett. 57, 1761 (1986)], which has been widely used in mesoscopic physics. The non-self-consistent simulation results confirm that the short mean-free-path optical phonon (OP) scattering, though expected to dominate even in a short channel CNTFET, essentially has no direct effect on the dc on current under modest gate biases. The self-consistent simulation results indicate that OP scattering, however, can have an indirect effect on the on current through self-consistent electrostatics. Using a high-kappa gate insulator suppresses the indirect effect and leads to a dc on current closer to the ballistic limit. The indirect effect in a CNT Schottky barrier FET can be more important than that in a metal-oxide semiconductor FET. \$CPY 2005
American Institute of Physics. 28 Refs.

L5 ANSWER 32 OF 47 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:1101025 CAPLUS
DOCUMENT NUMBER: 142:125760
TITLE: Nuclear magnetic resonance as a probe of nanometre-size orbital textures in magnetic transition metal oxides
AUTHOR(S): Papavassiliou, G.; Pissas, M.; Belesi, M.; Fardis, M.; Stamopoulos, D.; Kontos, A.; Hennion, M.; Dolinsek, J.; Ansermet, J. P.; Dimitropoulos, C.
CORPORATE SOURCE: Institute of Materials Science, NCSR, Athens, 153 10, Greece
SOURCE: Los Alamos National Laboratory, Preprint Archive, Condensed Matter (2004) 1-4, arXiv:cond-mat/0412371, 14 Dec 2004
CODEN: LNCMFR
URL: <http://xxx.lanl.gov/pdf/cond-mat/0412371>
PUBLISHER: Los Alamos National Laboratory
DOCUMENT TYPE: Preprint
LANGUAGE: English

AB The study of strong electron correlations in transition metal oxides with modern microscopy and diffraction techniques unveiled a fascinating world of nanosize textures in the spin, charge, and crystal structure. Examples range from high T_c superconducting cuprates and nickelates, to hole doped manganites and cobaltites. However, in many cases the appearance of these textures is accompanied with "glassiness" and multiscale/multiphase effects, which complicate significantly their exptl. verification. Here, we demonstrate how NMR may be uniquely used to probe nanosize orbital textures in magnetic transition metal oxides. As a convincing example we show for the first time the detection of nanoscale orbital phase separation in the ground state of the ferromagnetic insulator La_{0.875}Sr_{0.125}MnO₃.

REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 33 OF 47 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 6
ACCESSION NUMBER: 2004:127446 CAPLUS
DOCUMENT NUMBER: 140:346706
TITLE: Time-resolved spectroscopic behavior of Fe₂O₃ and ZnFe₂O₄ nanocrystals
AUTHOR(S): Fu, Limin; Wu, Zhenyu; Ai, Xicheng; Zhang, Jianping; Nie, Yuxin; Xie, Sishen; Yang, Guozhen; Zou, Bingsuo
CORPORATE SOURCE: Institute of Physics, Nanophysics and Nanodevice Lab, Chinese Academy of Sciences, Beijing, 100080, Peop. Rep. China
SOURCE: Journal of Chemical Physics (2004), 120(7), 3406-3413
CODEN: JCPSA6; ISSN: 0021-9606
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Using nanosecond (ns) and femtosecond (fs) time-resolved absorption spectroscopies (pump-probe technique), the carrier dynamics in transition metal oxide nanocrystals of α-Fe₂O₃ and ZnFe₂O₄ was studied during the photolysis process. For Fe₂O₃ and ZnFe₂O₄ nanocrystals, the fs measurements detect similar profiles of a pos. nonlinear absorption in their capped nanocrystals, whereas much weak signals in the naked particles. In the nanosecond measurements Fe₂O₃ and ZnFe₂O₄ nanocrystals show obvious excitation-power dependent absorption properties and at the low pump power they show weak photobleaching, but at high pump power they produce pos. nonlinear absorptions. For Fe₂O₃ nanocrystals, the threshold power of neg. absorption (bleach) to pos. absorption increases with reducing size, whereas for the ZnFe₂O₄ samples, the threshold powers reach min. at a critical size of 11 nm, grow for both the bigger and the smaller nanocrystals. These results reflect the influences of their microscopic magnetic couplings and carrier correlation on biexciton absorption in Fe₂O₃ and ZnFe₂O₄ nanocrystals. All the results indicate that the time resolved photoabsorption techniques are useful to study the microscopic spin interactions and carrier correlations in transition metal oxide nanocrystals.
REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 34 OF 47 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:555540 CAPLUS
DOCUMENT NUMBER: 142:121089
TITLE: 5CB liquid crystal as a specific probe for surface studies of metal-doped TiO₂ (anatase) nanoparticles
AUTHOR(S): Bezrodna, T.; Puchkovska, G.; Shimanovska, V.; Baran, J.
CORPORATE SOURCE: Institute of Physics, National Academy of Sciences of Ukraine, Kiev, 03022, Ukraine
SOURCE: Molecular Crystals and Liquid Crystals (2004), 413, 2207-2216
CODEN: MCLCD8; ISSN: 1542-1406
PUBLISHER: Taylor & Francis, Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Metal-doped Men+-TiO₂ (Me is Cu⁺, Mn²⁺, Cr²⁺, Co²⁺, Ni²⁺, Fe³⁺) anatase powders and heterogeneous systems Men+-TiO₂-4-pentyl-4'-cyanobiphenyl were studied by FTIR spectroscopy method. TiO₂ samples were produced by thermal hydrolysis of Ti chloride and as their spectroscopic data revealed, have different types of surface active centers and the amount of hydroxyl and hydrate covering. Doped metal cations increase a variety of possible active centers, disturbing surface OH-groups by coordination or ionic bonding. 5CB mols., approaching TiO₂ surface, displace adsorbed H₂O mols. and can create hydrogen bonds of -CN...HO-Ti= and

π -electrons...HO-Ti= types. The influence of metal cations is a polarizing effect on 5CB mols., which increases in a following row Cu+ < Mn2+ < Cr2+ < Co2+ < Ni2+ < Fe3+. This is in a perfect agreement with the polarizing activity of these cations. At that 5CB mols. change their orientation and possess some deformations, which is confirmed by the corresponding changes in spectral parameters of 5CB deformation modes.

REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 35 OF 47 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2004:8051810 INSPEC
DOCUMENT NUMBER: B2004-09-2560B-004
TITLE: A three-dimensional quantum simulation of silicon nanowire transistors with the effective-mass approximation
AUTHOR: Jing Wang; (Sch. of Electr. & Comput. Eng., Purdue Univ., West Lafayette, IN, USA), Polizzetti, E.; Lundstrom, M.
SOURCE: Journal of Applied Physics (15 Aug. 2004), vol.96, no.4, p. 2192-203, 23 refs.
CODEN: JAPIAU, ISSN: 0021-8979
SICI: 0021-8979(20040815)96:4L.2192:TDQS;1-#
Price: 0021-8979/2004/96(4)/2192(12)/\$20.00
Doc.No.: S0021-8979(04)01216-2
Published by: AIP, USA
DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical
COUNTRY: United States
LANGUAGE: English
AN 2004:8051810 INSPEC DN B2004-09-2560B-004
AB The silicon nanowire transistor (SNWT) is a promising device structure for future integrated circuits, and simulations will be important for understanding its device physics and assessing its ultimate performance limits. In this work, we present a three-dimensional (3D) quantum mechanical simulation approach to treat various SNWTs within the effective-mass approximation. We begin by assuming ballistic transport, which gives the upper performance limit of the devices. The use of a mode space approach (either coupled or uncoupled) produces high computational efficiency that makes our 3D quantum simulator practical for extensive device simulation and design. Scattering in SNWTs is then treated by a simple model that uses so-called Buettiker probes, which was previously used in metal-oxide-semiconductor field effect transistor simulations. Using this simple approach, the effects of scattering on both internal device characteristics and terminal currents can be examined, which enables our simulator to be used for the exploration of realistic performance limits of SNWTs

L5 ANSWER 36 OF 47 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:719396 CAPLUS
DOCUMENT NUMBER: 139:247586
TITLE: Modified metal oxide nanoparticle suspensions with hydrophobic inclusions
INVENTOR(S): Geiger, Albert; Griebel, Dragan; Herrmann, Rupert; Kuerzinger, Konrad
PATENT ASSIGNEE(S): Roche Diagnostics G.m.b.H., Germany;
Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung e.V.; F. Hoffmann-La Roche A.-G.
SOURCE: PCT Int. Appl., 43 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003074420	A1	20030912	WO 2003-EP2198	20030304
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
CA 2478430	A1	20030912	CA 2003-2478430	20030304
AU 2003212301	A1	20030916	AU 2003-212301	20030304
EP 1483203	A1	20041208	EP 2003-708174	20030304
EP 1483203	B1	20060614		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2005526681	T	20050908	JP 2003-572899	20030304
AT 329881	T	20060715	AT 2003-708174	20030304
ES 2265565	T3	20070216	ES 2003-3708174	20030304
US 2005208087	A1	20050922	US 2005-506862	20050509
PRIORITY APPLN. INFO.:			DE 2002-10209744	A 20020306
			WO 2003-EP2198	W 20030304
AB	Modified metal oxide nanoparticles are prepared by the sol-gel process containing hydrophobic inclusions and can include dye-type mols. as well as halogen-containing lanthanide coordination compds. The sol-gel process includes controlled hydrolysis of metal oxide or metal halide precursors, especially tetraethoxysilane and tetramethoxysilane, in the presence of a fluoro-organic alkoxy silane or an arylalkoxy silane, which incorporates hydrophobic or oleophobic target mols. into the nanoparticles. These manufactured nanoparticles have use especially as toners, sunscreen products, insecticides, and for marking of biomols.			
REFERENCE COUNT:	2	THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT		

L5 ANSWER 37 OF 47 CAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2003:757203 CAPLUS
 DOCUMENT NUMBER: 139:257732
 TITLE: Stabilized inorganic particles
 INVENTOR(S): Feng, Jun; Hammock, Bruce D.; Kennedy, Ian M.; Shan, Goumin; Maquieira, Angel
 PATENT ASSIGNEE(S): USA
 SOURCE: U.S. Pat. Appl. Publ., 18 pp.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003180780	A1	20030925	US 2003-393702	20030319
WO 2003080743	A2	20031002	WO 2003-US8619	20030319
WO 2003080743	A3	20060615		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW				

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY,
 KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES,
 FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR,
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG
 AU 2003225901 A1 20031008 AU 2003-225901 20030319
 PRIORITY APPLN. INFO.: US 2002-365845P P 20020319
 WO 2003-US8619 W 20030319

OTHER SOURCE(S): MARPAT 139:257732

AB Silane-coated metal oxide nanoparticles having desirable optical properties are provided by the invention, along with methods for their preparation and use. The nanoparticles have improved chemical and phys. stability

and may be used as labeling reagents for biol. and other mols. The compns. may be prepared by contacting the metal oxide nanoparticle with a silane, and irradiating the mixture with microwave radiation. Nanoparticles of Eu₂O₃ were coated with 3-aminopropyltrimethoxysilane and derivatized with an atrazine analog activated with thionyl chloride. The atrazine analog-Eu₂O₃ conjugate particles were used in a competitive immunoassay for atrazine.

L5 ANSWER 38 OF 47 INSPEC (C) 2007 IET on STN DUPLICATE 7
 ACCESSION NUMBER: 2003:7725158 INSPEC
 DOCUMENT NUMBER: A2003-20-8265-014
 TITLE: NO_x storage in model Pt/Ba NSR catalysts: fabrication and reactivity of BaO nanoparticles on Pt(111)
 AUTHOR: Stone, P.; (Dept. of Chem., Reading Univ., UK), Ishii, M.; Bowker, M.
 SOURCE: Surface Science (1 July 2003), vol.537, no.1-3, p. 179-90, 39 refs.
 CODEN: SUSCAS, ISSN: 0039-6028
 SICI: 0039-6028(20030701)537:1/3L.179:SMCF;1-4
 Price: 0039-6028/03/\$30.00
 Published by: Elsevier, Netherlands

DOCUMENT TYPE: Journal

TREATMENT CODE: Experimental

COUNTRY: Netherlands

LANGUAGE: English

AN 2003:7725158 INSPEC DN A2003-20-8265-014

AB We have employed high temperature scanning tunnelling microscopy to probe the adsorption of Ba on Pt(111) and its reactivity towards oxygen and NO. The aim of this work is to study the NO_x storage process. A novel approach to prepare a model of the NO_x exhaust catalyst has been used rather than the conventional deposition of a metal onto an oxide substrate. Ba grows on the Pt(111) surface in a Stranski-Krastanov mode, at high doses Ba nanoparticles are formed on a thin layer of Ba. The storage component of the catalyst has been prepared by reaction with oxygen at 573 K, which produces particles of BaO. The reactivity of this surface towards a mixture of O₂ and NO results in a dramatic increase in particle size which is attributed to the storage of NO_x in the form of the nitrate, Ba(NO₃)₂

L5 ANSWER 39 OF 47 INSPEC (C) 2007 IET on STN DUPLICATE 8
 ACCESSION NUMBER: 2004:7841715 INSPEC
 DOCUMENT NUMBER: A2004-05-6146-004
 TITLE: Local behavior of complex materials: scanning probes and nano structure
 AUTHOR: Bonnell, D.A.; Shao, R. (Dept. of Mater. Sci. & Eng., Pennsylvania Univ., Philadelphia, PA, USA)
 SOURCE: Current Opinion in Solid State & Materials Science (April 2003), vol.7, no.2, p. 161-71, 98 refs.
 CODEN: COSSFX, ISSN: 1359-0286
 SICI: 1359-0286(200304)7:2L.161:LBCM;1-M
 Price: 1359-0286/03/\$30.00

Published by: Elsevier, UK
DOCUMENT TYPE: Journal
TREATMENT CODE: General Review
COUNTRY: United Kingdom
LANGUAGE: English
AN 2004:7841715 INSPEC DN A2004-05-6146-004
AB Understanding the behavior of complex materials such as organic self-assembled monolayers, molecular and nano wires, and transition metal oxide thin films, is facilitated by probes of local properties. Recent extensions of scanning probe microscopies that extract electrical potential, capacitance, dielectric constant, electromechanical coupling coefficients and impedance, are described. In most cases, these complex properties are accessed by stimulations and/or response function detection with multiple frequency modulations. Several illustrative examples include determination of the electronic structure of individual defects in a carbon nanotube, ferroelectric domain interactions in oxide thin films, and electric potential of an alkanethiol on metal

L5 ANSWER 40 OF 47 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2004:7955808 INSPEC
DOCUMENT NUMBER: A2004-12-8185-025; B2004-06-0585-021
TITLE: Nanotechnology: MEMS and NEMS and their applications to smart systems and devices
AUTHOR: Varadan, V.K. (Center for the Eng. of Electron. & Acoust. Mater. & Devices, Pennsylvania State Univ., University Park, PA, USA)
SOURCE: Proceedings of the SPIE - The International Society for Optical Engineering (2003), vol.5062, no.1, p. 20-43, 23 refs.
CODEN: PSISDG, ISSN: 0277-786X
SICI: 0277-786X(2003)5062:1L.20:NMNT;1-H
Price: 0277-786X/03/\$15.00
Published by: SPIE-Int. Soc. Opt. Eng, USA
Conference: Smart Materials, Structures, and Systems, Bangalore, India, 12-14 Dec. 2002
DOCUMENT TYPE: Conference; Conference Article; Journal
TREATMENT CODE: Application
COUNTRY: United States
LANGUAGE: English
AN 2004:7955808 INSPEC DN A2004-12-8185-025; B2004-06-0585-021
AB The microelectronics industry has seen explosive growth during the last thirty years. Extremely large markets for logic and memory devices have driven the development of new materials, and technologies for the fabrication of even more complex devices with features sizes now down at the sub micron and nanometer level. Recent interest has arisen in employing these materials, tools and technologies for the fabrication of miniature sensors and actuators and their integration with electronic circuits to produce smart devices and systems. This effort offers the promise of: (1) increasing the performance and manufacturability of both sensors and actuators by exploiting new batch fabrication processes developed including micro stereo lithographic and micro molding techniques; (2) developing novel classes of materials and mechanical structures not possible previously, such as diamond like carbon, silicon carbide and carbon nanotubes, micro-turbines and micro-engines; (3) development of technologies for the system level and wafer level integration of micro components at the nanometer precision, such as self-assembly techniques and robotic manipulation; (4) development of control and communication systems for MEMS devices, such as optical and RF wireless, and power delivery systems, etc. A novel composite structure can be tailored by functionalizing carbon nano tubes and chemically bonding them with the polymer matrix e.g. block or graft copolymer, or even cross-linked copolymer, to impart exceptional structural, electronic

and surface properties. Bio- and Mechanical-MEMS devices derived from this hybrid composite provide a new avenue for future smart systems. The integration of NEMS (NanoElectroMechanical Systems), MEMS, IDTs (Interdigital Transducers) and required microelectronics and conformal antenna in the multifunctional smart materials and composites results in a smart system suitable for sending and control of a variety functions in automobile, aerospace, marine and civil structures and food and medical industries. This unique combination of technologies also results in novel conformal sensors that can be remotely sensed by an antenna system with the advantage of no power requirements at the sensor site. This paper provides a brief review of MEMS and NEMS based smart systems for various applications mentioned above. Carbon Nano Tubes (CNT) with their unique structure, have already proven to be valuable in their application as tips for scanning probe microscopy, field emission devices, nanoelectronics, H₂-storage, electromagnetic absorbers, ESD, EMI films and coatings and structural composites. For many of these applications, highly purified and functionalized CNT which are compatible with many host polymers are needed. A novel microwave CVD processing technique to meet these requirements has been developed at Penn State Center for the Engineering of Electronic and Acoustic Materials and Devices (CEEAMD). This method enables the production of highly purified carbon nano tubes with variable size (from 5 - 40 nm) at low cost (per gram) and high yield. Whereas, carbon nano tubes synthesized using the laser ablation or arc discharge evaporation method always include impurity due to catalyst or catalyst support. The Penn State research is based on the use of zeolites over other metal/metal oxides in the microwave field for a high production and uniformity of the product. An extended conventional purification method has been employed to purify our products in order to remove left over impurity. A novel composite structure can be tailored by functionalizing carbon nano tubes and chemically bonding them with the polymer matrix e.g. block or graft copolymer, or even cross-linked copolymer, to impart exceptional structural, electronic and surface properties. Bio- and Mechanical-MEMS devices derived from this hybrid composites will be presented

L5 ANSWER 41 OF 47 CAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2002:794196 CAPLUS
 DOCUMENT NUMBER: 137:306985
 TITLE: Functionalized fluorescent nanocrystals with linked molecular probes and their use to form dendrimers in a signal amplification system
 INVENTOR(S): Barbera-Guillem, Emilio; Nelson, M. Bud; Castro, Stephanie L.
 PATENT ASSIGNEE(S): Bio-Pixel Ltd., USA
 SOURCE: U.S. Pat. Appl. Publ., 23 pp., Cont.-in-part of U.S. 6,261,779.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 12
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2002150905	A1	20021017	US 2001-904744	20010713
US 6828142	B2	20041207		
US 6261779	B1	20010717	US 1999-437076	19991109
WO 2000028089	A1	20000518	WO 1999-US26616	19991110
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW				

RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE,
DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: US 1998-107828P P 19981110
US 1999-437076 A2 19991109
US 1998-109626P P 19981124

AB Provided are compns. and assay kits comprising functionalized nanocrystals having extending therefrom a plurality of polynucleotide strands of known sequence; wherein primary dots are used to operably link to a mol. probe, and secondary dots comprise a plurality of polynucleotide strands which are complementary to the plurality of polynucleotide strands of the primary dots. Compns. and methods for the preparation of water-soluble, functionalized nanocrystals ("primary dot"), which has a CdSe core, a ZnS shell, amino acid capping (such as diaminocarboxylic acid), and affinity ligand, or a combination thereof, are also provided. A second species of functionalized nanocrystals ("secondary dots") also have strands of polynucleotides of known sequence extending therefrom, wherein the nucleic acid sequence of the polynucleotide strands of the secondary dots is sufficiently complementary to the mol. probe on the primary dots such that, under suitable conditions for promoting contact and hybridization, the resp. complementary strands hybridize to each other in forming a dendrimer. Also provided is a method for detecting the presence or absence of target mol. in a sample comprising operably linking primary dots to mol. probe, contacting the complex formed with the sample, contacting the sample with successive addns. of secondary dots and primary dots. If target mol. is present in the sample, the primary dots and secondary dots will form dendrimers that can be detected by fluorescence emission.

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 42 OF 47 INSPEC (C) 2007 IET on STN

ACCESSION NUMBER: 2002:7349398 INSPEC

DOCUMENT NUMBER: A2002-19-0779-001; B2002-09-2550N-015

TITLE: Carbon nanotube scanning probe for profiling of deep-ultraviolet and 193 nm photoresist patterns

AUTHOR: Nguyen, C.V.; Stevens, R.M.D.; Barber, J.; Jie Han; Meyyappan, M.; (Ames Res. Center, Moffett Field, CA, USA), Sanchez, M.I.; Larson, C.; Hinsberg, W.D.

SOURCE: Applied Physics Letters (29 July 2002), vol.81, no.5, p. 901-3, 14 refs.

CODEN: APPLAB, ISSN: 0003-6951

SICI: 0003-6951(20020729)81:5L.901:CNSP;1-L

Price: 0003-6951/2002/81(5)/901(3)/\$19.00

Doc.No.: S0003-6951(02)06129-6

Published by: AIP, USA

DOCUMENT TYPE: Journal

TREATMENT CODE: Experimental

COUNTRY: United States

LANGUAGE: English

AN 2002:7349398 INSPEC DN A2002-19-0779-001; B2002-09-2550N-015

AB The continual scaling down of complementary metal-oxide semiconductor feature size to 100 nm and below necessitates a characterization technique to resolve high-aspect-ratio features in the nanoscale regime. We report the use of atomic force microscopy coupled with high-aspect-ratio multiwalled carbon nanotube (MWCNT) scanning probe tip for the purpose of imaging surface profile of photoresists. MWCNT tips of 5-10 nm in diameter and about a micron long are used. Their exceptional mechanical strength and ability to buckle reversibly enable resolution of steep, deep nanoscale features. Images of photoresist patterns generated by 257 nm interference lithography as well as 193 nm lithography are presented to demonstrate MWCNT scanning probe tips for applications in metrology

L5 ANSWER 43 OF 47 INSPEC (C) 2007 IET on STN DUPLICATE 9
 ACCESSION NUMBER: 2001:7119850 INSPEC
 DOCUMENT NUMBER: A2002-02-7360J-006; B2002-01-2530C-114
 TITLE: Quantum confinement in nanocrystalline Si
 superlattices
 AUTHOR: Grom, G.F.; (Mater. Sci. Program, Rochester Univ.,
 NY, USA), Fauchet, P.M.; Tsybeskov, L.; McCaffrey,
 J.P.; Labbe, H.J.; Lockwood, D.J.
 SOURCE: Structure and Electronic Properties of Ultrathin
 Dielectric Films on Silicon and Related Structures.
 Symposium (Materials Research Society Symposium
 Proceedings Vol.592), 2000, p. 363-8 of xi+386 pp., 10
 refs.
 Editor(s): Buchanan, D.A.; Edwards, A.H.; von
 Bardeleben, H.J.; Hattori, T.
 ISBN: 1 55899 500 5
 Published by: Mater. Res. Soc, Warrendale, PA, USA
 Conference: Structure and Electronic Properties of
 Ultrathin Dielectric Films on Silicon and Related
 Structures. Symposium, Boston, MA, USA, 29 Nov.-1 Dec.
 1999
 DOCUMENT TYPE: Conference; Conference Article
 TREATMENT CODE: Experimental
 COUNTRY: United States
 LANGUAGE: English
 AN 2001:7119850 INSPEC DN A2002-02-7360J-006; B2002-01-2530C-114
 AB Photoconductance spectroscopy was used to probe the effects of
 quantum confinement in nanocrystalline (nc)-Si/amorphous (a)-SiO₂
 superlattices (SLs). A metal-oxide semiconductor
 (MOS) like structure with the nc-Si SL incorporated in the oxide was
 fabricated to study charging/discharging processes in Si
 nanocrystals. The fine structure observed in photoconductance
 spectra at low temperatures was interpreted in terms of singularities in
 the carrier density of states, possibly due to energy quantization. In
 addition, a low resistance sample exhibited photocurrent oscillations
 with a frequency of several KHz, which could be a manifestation of
 sequential resonant carrier tunneling in the nc-Si/a-SiO₂ SL

L5 ANSWER 44 OF 47 CAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 1998:388656 CAPLUS
 DOCUMENT NUMBER: 129:69557
 TITLE: Method for preparing metal-intercalated fullerene-like
 chalcogenides
 INVENTOR(S): Homyonfer, Moshe; Tenne, Reshef; Feldman, Yishay
 PATENT ASSIGNEE(S): Yeda Research and Development Co., Ltd., Israel
 SOURCE: PCT Int. Appl., 43 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9823796	A1	19980604	WO 1997-IL390	19971127
W: BR, CA, CN, IL, JP, KR, RU, US				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
CA 2272100	A1	19980604	CA 1997-2272100	19971127
CA 2272100	C	20051101		
EP 948671	A1	19991013	EP 1997-946024	19971127
EP 948671	B1	20020220		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,				

IE, FI

CN 1245540	A	20000223	CN 1997-181571	19971127
BR 9713308	A	20000321	BR 1997-13308	19971127
JP 2001504794	T	20010410	JP 1998-524485	19971127
AT 213511	T	20020315	AT 1997-946024	19971127
RU 2194807	C2	20021220	RU 1999-113540	19971127
IL 129979	A	20031123	IL 1997-129979	19971127
KR 2000057250	A	20000915	KR 1999-704631	19990526
US 6217843	B1	20010417	US 2000-308663	20000403
PRIORITY APPLN. INFO.:			IL 1996-119719	A 19961129
			WO 1997-IL390	W 19971127

AB The method for preparing nanoparticles or nanowhiskers of a M₂-doped M₁ oxide (M₁ is selected from In, Ga, Sn and a transition metal; M₂ is any metal), comprises heating a M₁ material with water vapor or in a vacuum apparatus at a base pressure of 10⁻³ to 10⁻⁵ Torr, or electron beam-evaporating the M₁ material with water or with an O-containing volatile solvent in a vacuum pressure at a base pressure of 10⁻⁵ to 10⁻⁶ Torr in the presence of a M₂ salt, and recovering the M₂-doped M₁ oxide from the walls of the vacuum apparatus. The method for preparing M₂-intercalated and/or M₂-encaged inorg. fullerene-like (IF) structures (M₁, M₂ as above) comprises heating a M₁ material with water vapor or in a vacuum apparatus at a base pressure of 10⁻³ to 10⁻⁵ Torr, or electron beam-evaporating the M₁ material with water or with an O-containing volatile solvent in a vacuum pressure at a base pressure of 10⁻⁵ to 10⁻⁶ Torr in the presence of a M₂ salt, annealing the M₂-doped M₁ oxide in a reducing atmospheric with H₂X gas (X = S, Se, or Te), and recovering the M₂-intercalated and/or M₂-encaged IF-like structures of the M₁ chalcogenide. Preferably, the M₂ salt is selected from alkali metal, alkaline earth, and transition metal salts, especially alkali metal chlorides. The intercalated and/or encaged IF structures are suitable for use as lubricants, and also form stable suspensions, e.g., in alc., and electrophoretic deposition from the suspensions on conductive substrates yields a thin film of intercalated IF-like material, e.g., as photosensitive element in solar cells, for manufacturing batteries, in electrochromic devices, and as single-layer film on the tip of scanning probe microscopes. W wire was heated in steam to give WO₃ that was reduced with H₂S to give the sulfide that was intercalated with an alkali metal chloride to give the IF-like material.

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 45 OF 47 CAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 1997:635028 CAPLUS
 DOCUMENT NUMBER: 127:300421
 TITLE: Electronic structure of transition metal oxide nanostructures
 AUTHOR(S): Sanz, J. M.; Tyuliev, G. T.; Morant, C.; Soriano, L.; Espinos, J. P.; Fernandez, A.; Gonzalez-Elipe, A. R.
 CORPORATE SOURCE: Dpt. Fisica Aplicada C-XII, Universidad Autonoma de Madrid, Madrid, E-28049, Spain
 SOURCE: Journal of Surface Analysis (1997), 3(2), 279-285
 CODEN: JSANFX; ISSN: 1341-1756
 PUBLISHER: Hyomen Bunseki Kenkyukai
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB The authors report on the use of large area electron spectroscopies like X-ray photoemission, resonant photoemission and X-ray absorption spectroscopy, to probe the electronic structure of nanoparticles and ultrathin films of transition metal oxides. Highly defective NiO nanoparticles (2-5 nm) have been studied using X-ray and electron spectroscopies. The Ni2p XAS spectrum shows convincingly that these particles do not involve Ni as previously thought. The high sensitivity of the Ni2p XPS core level lineshape to the local coordination of the nickel atoms (i.e. to defects, nearest and next

nearest neighbors) is demonstrated studying the growth of ultrathin NiO films on MgO(100). The use of resonant photoemission to identify the Ti3d derived valence band states in the valence band of ultrathin TiO₂ films grown on SiO₂ is also shown.

REFERENCE COUNT: 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 46 OF 47 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 1997:5491757 INSPEC
DOCUMENT NUMBER: B1997-03-2560R-047
TITLE: Silicon metal-oxide-semiconductor field-effect transistor with gate structures defined by scanned probe lithography
AUTHOR: Hagedorn, M.S.; Litfin, D.D.; Price, G.M.; Gordon, A.E.; Higman, T.K. (Dept. of Electr. Eng., Minnesota Univ., Minneapolis, MN, USA)
SOURCE: Journal of Vacuum Science & Technology B (Microelectronics and Nanometer Structures) (Nov.-Dec. 1996), vol.14, no.6, p. 4153-6, 8 refs.
CODEN: JVTBD9, ISSN: 0734-211X
SICI: 0734-211X(199611/12)14:6L.4153:SMOS;1-3
Price: 0734-211X/96/14(6)/4153/4/\$10.00
Published by: AIP for American Vacuum Soc, USA
Conference: 40th International Conference on Electron, Ion, Photon Beam Tech and Nanofabrication, Atlanta, GA, USA, 28-31 May 1996
Sponsor(s): American Vacuum Soc.; IEEE; Opt. Soc. America
DOCUMENT TYPE: Conference; Conference Article; Journal
TREATMENT CODE: Practical; Experimental
COUNTRY: United States
LANGUAGE: English
AN 1997:5491757 INSPEC DN B1997-03-2560R-047
AB We report on the use of scanned probes to define nanolithographic features in the controlling gate structures of silicon metal-oxide-semiconductor field-effect transistors (MOSFETs). By using an atomic force microscope (AFM) with conducting tips (either Ti coated Si₃N₄ or heavily doped Si cantilevers) in conjunction with surface adsorbed water, we define oxide structures by anodization which are used as masks for subsequent etching. These patterns consist of such things as constrictions and gratings in the gate. When combined with thin oxides, the pattern of the gate is mirrored in the higher mobility MOSFET inversion layer. Pattern transfer into the gate is accomplished by either direct anodization of the gate material (titanium) or by anodization of sacrificial resists consisting of plasma-deposited organosilicon polymers from methylsilane precursors. The AFM anodization of titanium has been thoroughly described in the literature, and the AFM anodization of the plasma-deposited organosilicon is thought to be a similar mechanism but the organosilicon is also photo-oxidizable when exposed to deep-UV radiation in the presence of oxygen. Using these two methods (direct anodization of gate material and anodization of sacrificial resists) enables AFM lithography to be carried at virtually any step in the process flow. In this way, nanostructure definition can be carried out as a last step in a standard process or may be inserted earlier. Completed devices and their characteristics are shown

L5 ANSWER 47 OF 47 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 10
ACCESSION NUMBER: 1996:694700 CAPLUS
DOCUMENT NUMBER: 126:68207
TITLE: Proximal probe-based fabrication of nanostructures
AUTHOR(S): Campbell, P. M.; Snow, E. S.
CORPORATE SOURCE: Naval Res. Lab., Washington, DC, 20375, USA

SOURCE: Semiconductor Science and Technology (1996), 11(11S),
1558-1562

CODEN: SSTEET; ISSN: 0268-1242

PUBLISHER: Institute of Physics Publishing

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The authors describe a simple and reliable process for the fabrication of nanometer-scale silicon structures by using the local elec. field of a proximal probe tip (either an STM or a conducting tip atomic force microscope) to write surface oxide patterns by local anodic oxidation. These oxide patterns can be used as masks for selective etching to transfer the pattern into the substrate. This process has been used to fabricate side-gated Si field-effect transistors with critical features as small as 30 nm. Alternatively, this process of anodic oxidation can be used to oxidize completely through thin metal films to make lateral metal-oxide-metal tunnel junctions.